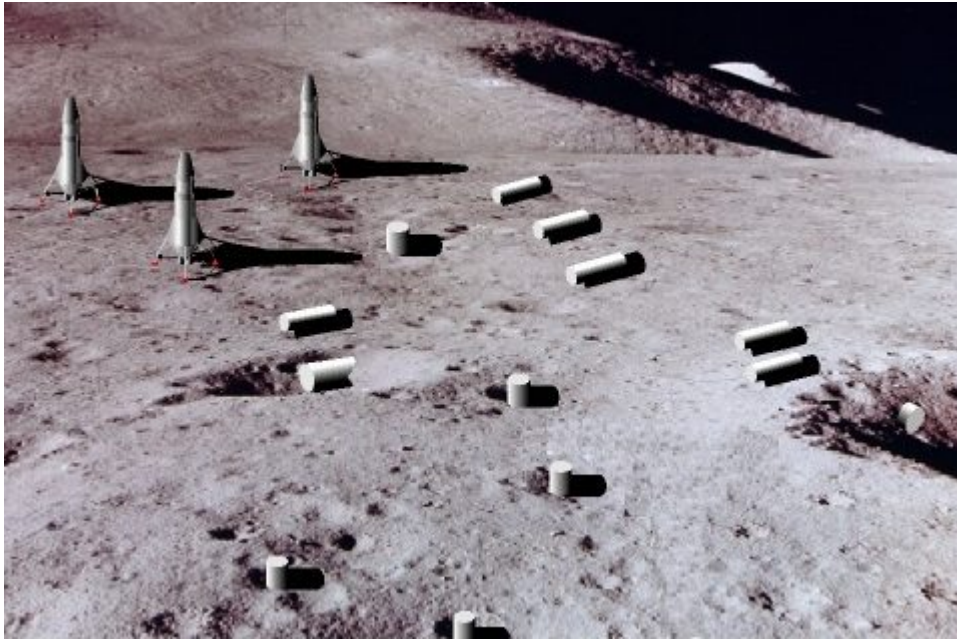


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## Horizon Lunar Outpost

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Horizon Lunar Outpost  
Horizon Lunar Outpost - the US Army on the Moon, 1959  
Credit: © Mark Wade

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American manned lunar base. Study 1959. In 1959 the US Army completed a plan for a manned military outpost on the moon.

*Status:* Study 1959.

The Horizon lunar outpost was said to be necessary to protect United States interests on the moon; to conduct moon-based surveillance of the earth and space, to act as a communications relay, and to serve as a base for exploration of the moon. The permanent outpost would cost \$6 billion and become operational in December 1966 with 12 soldiers.

In designing the base, Wernher von Braun appointed Heinz Koelle to head the project team at Redstone Arsenal. Spacecraft components would be lofted in 147 Saturn C-I and C-II booster launches, and then assembled in low earth orbit at an austere spent-tank space station. A Lunar landing and return vehicle would shuttle up to sixteen astronauts at a time to the base and back. Construction would begin in April 1965 and the base was to become operational by December 1966 at Sinus Aestuum or Mare Imbrium. The base would be defended against Russian overland attack by man-fired weapons - unguided Davy Crockett rockets with low-yield nuclear warheads, and conventional claymore mines modified to puncture pressure suits.

Four major conclusions were reached:

- Political, scientific, and security considerations indicated that it was imperative for the United States to establish a lunar outpost at the earliest practicable date.
- Project Horizon represented the earliest feasible capability for the U. S. to establish a lunar outpost. By its implementation, the United States could establish an

operational lunar outpost by late 1966, with the initial manned landings in the spring of 1965.

- A delayed decision to proceed with the program, or adequate funding, would forfeit the chance of defeating the USSR in a space race which was already openly recognized as such throughout the world.
- Waiting for evidence of substantial Soviet progress in a lunar outpost program would result in a crash American program in response, resulting in significantly higher costs and lower reliability.
- The U. S. Army possessed the capability of making significant contributions in all aspects of such a program.

The basic carrier vehicles for Project Horizon would be the Saturn I and II. The Saturn I, then being developed under an ARPA order, would be fully operational by October 1963. The Saturn II, an outgrowth of the Saturn I program, could be developed during the period 1962-1964. The Saturn II would utilize improved engines in the Saturn I first stage and oxygen/hydrogen engines in all of its upper stages.

By the end of 1964, a total of 72 Saturn vehicles should have been launched in U. S. programs, of which 40 were expected to contribute to the accomplishment of Horizon. Cargo delivery to the moon would begin in January 1965. The first manned landing by two men would be made in April 1965. The build-up and construction phase would be continued without interruption until the outpost was ready for beneficial occupancy and was manned by a task force of 12 men in November 1966.

This build-up program required 61 Saturn I and 88 Saturn II launchings through November 1966, the average launching rate being 5.3 per month. During this period some 220 metric tons of useful cargo would be transported to the moon

During the first operational year of the lunar outpost, December 1966 through 1967, a total of 64 launchings were scheduled. These would result in an additional 120 metric tons of useful cargo on the moon

The total cost of the eight and one-half year program presented in the study was estimated to be six billion dollars. This was an average of approximately \$700 million per year. It was interesting to note that this estimate was of the right order of magnitude, but still only a fifth of the actual cost of the Apollo program (and its cancelled follow-ons) which could have resulted in an equivalent base being created on the moon. The schedule was rather optimistic; the Apollo program began only two years after the Horizon report, but a moon base would not have been established earlier than the 1970's.

The lunar outpost proposed for Project Horizon was a permanent facility capable of supporting a complement of 12 men engaged in a continuing operation. The exact location of the outpost site could not be determined until an exploratory probe and mapping program had been completed. However rocket vehicle energy requirements would limit the base location to an area within 20 deg latitude/longitude of the optical center of the moon. Within this area, three particular sites were chosen which appeared to meet the more detailed requirements of landing space, surface conditions, communications, and proximity to varied lunar "terrain". These were the northern part of Sinus Aestuum, near Erasthenes; the southern part of Sinus Aestuum near Sinus Medii; and the southwest coast of Mare Imbrium, just north of the Apennines

The first two men would arrive on the lunar surface in April 1965. They would be guided to an area in which the cargo build-up for future construction had already begun. While their landing vehicle would have an immediate return-to-earth capability; it was intended that they remain in the area until after the arrival of the advance party of the construction crew. The mission of the original two men would be primarily one of verification of previous

unmanned environmental investigations and confirmation of the site selection and cargo delivery.

The basic building block for the outpost would be cylindrical metal tanks, 3.05 m in diameter and 6.10 m in length. During the construction period, the initial workforce would be gradually augmented until a final complement of 12 men was reached. The construction camp was a minimum facility and would be made operational within 15 days after the beginning of active work at the outpost site. Two nuclear reactors would be located in pits to provide shielding and provide power for the operation of the preliminary quarters and for the equipment used in the construction of the permanent facility. Empty cargo and propellant containers would be assembled and used for storage of bulk supplies, weapons, and life essentials. Two types of surface vehicles would be landed, one a construction vehicle for lifting, digging, and scraping, the other a transport vehicle for more extended distance trips needed for hauling, reconnaissance, rescue, and the like. A lightweight parabolic antenna erected near the main quarters would provide communications with earth. At the conclusion of the construction phase the original construction camp quarters would be converted to a bio-science and physics-science laboratory.

All main structures would be buried beneath the surface. This would provide a uniform temperature (-40 deg C), protection from meteoroids, security from attack, good insulation, and radiation protection. Each of the quarters and cylinders would be a special double-walled thermos vacuum tank. Investigations showed that the incidental heat given off by an adequate internal lighting system would nominally supply essentially all of the heat required to maintain comfortable "room" temperature in the outpost quarters.

A nitrogen/oxygen atmosphere would be provided within the quarters. The weights and volumes of both gases were quite reasonable and presented no unusual problem of supply. Carbon dioxide and moisture would be controlled initially by a solid chemical absorbent and dehumidifier. A carbon dioxide freeze-out system, which would eliminate the need for resupply of chemical absorbent, would be installed later. Initially, all food would be pre-cooked; however, as water supplies increased with the introduction of a reclaiming system, dehydrated and fresh-frozen foods would be used. Initial experiments with hydroponics culture of salads would lead to the development of other closed-cycle food product systems.

*Crew Size: 12.*

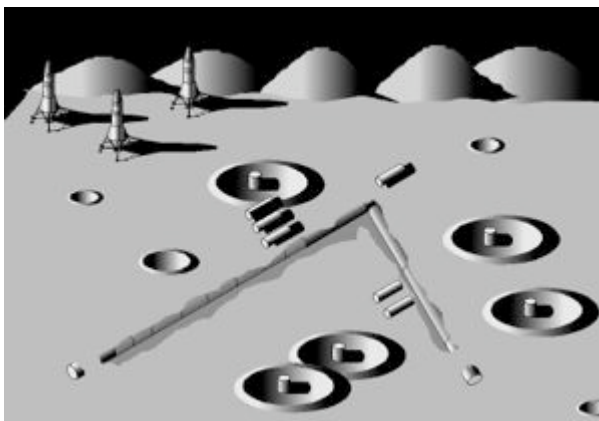
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*Family: [Lunar Bases](#), [Moon](#). People: [von Braun](#). Country: [USA](#). Spacecraft: [Horizon LERV](#). Launch Vehicles: [Saturn C-2](#), [Saturn I](#). Bibliography: [16](#).*

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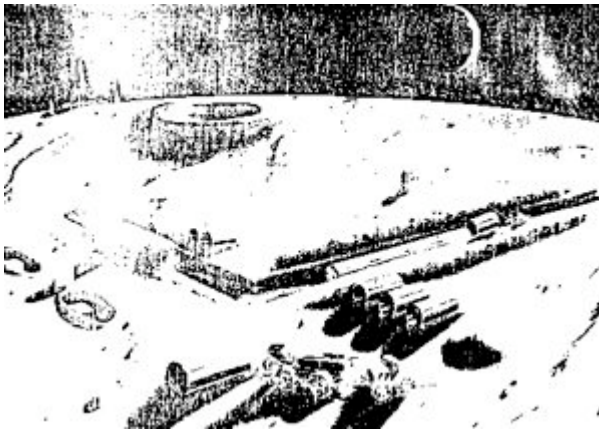
### Photo Gallery

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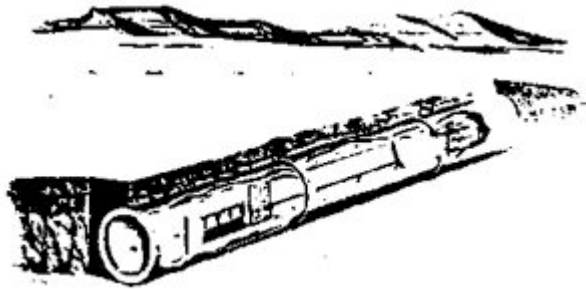


Horizon Moon Outpost  
Horizon Lunar Outpost  
Credit: © Mark Wade

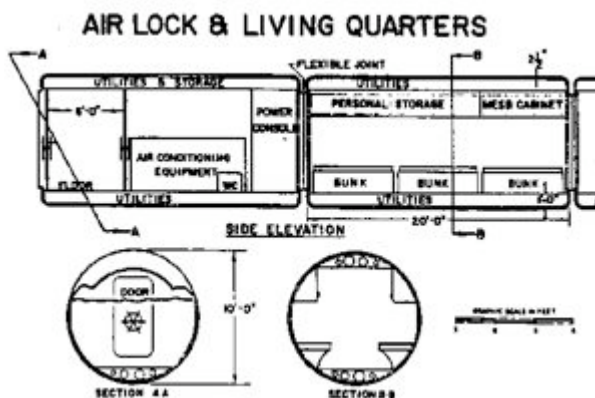
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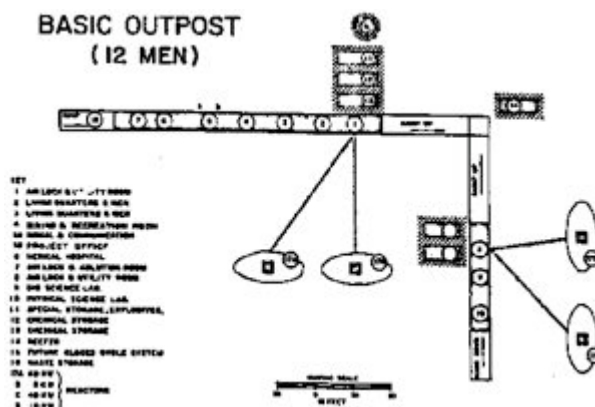
Horizon Final Base  
Project Horizon Lunar  
Outpost in as it would  
appear by late 1965  
Credit: US Army



Horizon Compartment  
Cross Section of Typical  
Project Horizon Lunar  
Outpost Compartment  
Credit: US Army



Horizon Camp  
Overall View of Initial  
Project Horizon Lunar  
Construction Camp  
Credit: US Army



Horizon First Camp  
Layout of Project  
Horizon Lunar Basic 12-  
Man Outpost  
Credit: US Army

1959 April 24 - .

- All three military services studying a base on the moon - . Nation: [USA](#).  
Related Persons: [Schriever](#). Spacecraft: [Horizon Lunar Outpost](#), [Lunex](#), [Navy SLV](#), ,  
[Man-In-Space-Soonest](#).

Testifying before the Senate Committee on Aeronautical and Space Sciences, Maj. Gen. Bernard A. Schriever, Commander of the Air Force Ballistic Missile Division, stated that all three military services should be studying the possibility of a base on the moon. Up to that point, he felt, all such studies had been "in the blue thinking."

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[Back to top of page](#)

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[Home](#) - [Search](#) - [Browse](#) - [Alphabetic Index: 0- 1- 2- 3- 4- 5- 6- 7- 8- 9](#)  
[A- B- C- D- E- F- G- H- I- J- K- L- M- N- O- P- Q- R- S- T- U- V- W- X- Y- Z](#)

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